

Summary of TMDLs for Chlorpyrifos and Diazinon In Lower Salinas River Watershed

SCHEDULE

Public Workshop Summarizing TMDL elements on January 13, 2010.

Draft Project Report and Basin Plan amendment documents:

To Interested Parties on February 1, 2010.

Public comment due March 18, 2010.

Proposed Project Report and Basin Plan amendment documents for Water Board Hearing:

To Interested Parties on April 28, 2010.

Board Hearing May 13, 2010.

Introduction

This Project addresses impairment of the Lower Salinas River and several of its tributaries due to elevated concentrations of two currently registered organophosphate (OP) pesticides: chlorpyrifos and diazinon.

Multiple waterbodies in the Project Area are listed as impaired by chlorpyrifos and/or diazinon on the States' "List of Water Quality Limited Segments" (List) pursuant to Clean Water Act Section 303(d) because they exceed toxicity and pesticides water quality objectives. The Clean Water Act requires the State to develop Total Maximum Daily Loads (TMDLs) for waters on the List. A TMDL is the maximum amount of pollutant that a waterbody can receive and still safely meet water quality standards. State law requires development of implementation plans to achieve the TMDLs. Therefore, a TMDL is also a planning and implementation tool used to help regulatory programs implement strategies to achieve water quality standards.

Water Board staff will propose the adoption of an amendment to the Central Coast Water Quality Control Plan (Basin Plan) to incorporate TMDLs for chlorpyrifos and diazinon in the Lower Salinas River watershed at the May 2010 Water Board hearing. Staff is proposing the following waterbodies be assigned TMDLs: Moss Landing Harbor (South), Old Salinas River Estuary, Salinas River Lagoon (North), Tembladero Slough, Alisal Slough, Blanco Drain, Salinas Reclamation Canal, Salinas River (Lower), Espinosa Slough, Espinosa Lake, Natividad Creek, Quail Creek, and Chualar Creek. Throughout this Project Summary, staff collectively refers to the Lower Salinas River and all tributaries and receiving waters of the Lower Salinas River as the Lower Salinas River watershed. Figure 1 shows the extent of the Project Area.



The Central Coast Region's Basin Plan contains both narrative and numeric water quality objectives that apply to all inland surface waters, enclosed bays and estuaries. The applicable water quality objects for this proposed Project are narrative and include:

All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.

Pesticides

No individual pesticide or combination of pesticides shall reach concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life.

Beneficial Uses

The designated beneficial uses for inland waters and coastal waters are identified in the Basin Plan for the listed waterbodies. These are shown in Tables 1 and 2.

Table 1. Basin-Plan designated Beneficial Uses for Inland Waters

Waterbody Names	MUN	AGR	PROC	IND	GWR	REC1	REC2	WILD	COLD	WARM	MIGR	SPWN	BIOL	RARE	EST	FRESH	COMM	SHELL
Moro Cojo Slough					X	X	X	X	X	X		X	X	X	X		X	X
Old Salinas River Estuary						X	X	X	X	X	X	X	X	X	X		X	X
Tembladero Slough						X	X	X		X		X		X	X		X	X
Espinosa Lake						X	X	X		X							X	
Espinosa Slough						X	X	X		X							X	
Salinas Reclamation Canal						X	X	X		X							X	
Alisal Creek	X	X			X	X	X	X	X	X		X					X	
Blanco Drain						X	X	X		X							X	
Salinas River Refuge Lagoon (South)						X	X	X	X	X	X		X	X			X	X
Salinas River Lagoon (North)						X	X	X	X	X	X	X	X	X	X		X	X
Salinas River, dnstr of Spreckels Gage	X	X					X	X	X	X	X					X	X	
Salinas River, Spreckels Gage-Chualar	X	X	X	X	X	X	X	X	X	X	X						X	
Salinas Riv, Chualar-Nacimiento Riv	X	X	X	X	X	X	X	X	X	X	X	X		X			X	

Note: Beneficial uses are regarded as existing whether the water body is perennial or ephemeral, or the flow is intermittent or continuous.

Table 2. Existing and Anticipated Uses of Elkhorn Slough and Moss Landing Harbor (Coastal Waters)

Coastal Water	REC-1	REC-2	IND	NAV	MAR	SHELL	COMM	RARE	WILD
Elkhorn Slough ^a	E	E			E	E	E	E	E
Moss Landing Harbor	E	E	E	E	E	E ^b	E	E	E

^a Elkhorn Slough has been designated an ecological reserve by the California Department of Fish and Game, and recognized as a National Estuary Sanctuary by the Federal Government.

^b Clamming is an existing beneficial use in the North Harbor and on the south side of the entrance channel to Elkhorn Slough (north of the Pacific Gas and Electric Cooling Water Intake). Presently, no shellfishing use occurs south of the Pacific Gas and Electric Intake.

NOTE: E = Existing beneficial water use.

Water Quality Assessment

Water Board staff performed a water quality assessment in accordance with the State Water Resources Control Board Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy. SWRCB, 2004). Staff used water quality criteria of 0.025 micrograms per liter (µg/L) for chlorpyrifos and 0.16 µg/L for diazinon to protect aquatic life beneficial uses to perform the assessment. The water quality criteria used for the assessment was derived from the California Department of Fish and Game's *Water Quality Criteria for Diazinon and Chlorpyrifos* (Sipmann and Finlayson, 2000). Table 3 contains a list of impaired waterbodies based on the assessment and the pesticide(s) causing the impairment.

Table 3. Impaired waterbodies addressed in TMDL project.^a

Impaired waterbodies	Pollutant	
	Chlorpyrifos	Diazinon
Moss Landing Harbor, South ^b	X	X
Old Salinas River Estuary	X	X
Salinas River Lagoon (North)	X	
Tembladero Slough	X	X
Alisal Slough		X
Blanco Drain	X	X
Salinas Reclamation Canal, Lower ^c	X	X
Salinas Reclamation Canal, Upper/ Alisal Creek ^d	X	X
Salinas River ^e	X	X
Espinosa Slough ^f		X
Espinosa Lake ^g	X	X
Natividad Creek		X
Quail Creek	X	X
Chualar Creek	X	X
Total waterbody/pollutant combinations	11	13

^a Includes entire waterbody segment except as noted.

^b Moss Landing Harbor south of Sandholt Bridge to tidal gates at Potrero Rd.

^c From confluence of Natividad Creek to confluence of Tembladero Slough.

^d From confluence of Natividad Creek and extending 2 miles south of Airport Rd.

- ^e From Salinas River Lagoon (North) to Gonzales Road.
^f From confluence of Salinas Reclamation Canal (Lower) to Espinosa Lake.
^g Espinosa Lake and all unnamed tributaries.

Sources

Staff has identified the significant sources of diazinon and chlorpyrifos contributing to impairment in the listed waterbodies as:

- Discharges from irrigated lands.
- Discharges from storm water.

Numeric Targets

Water Board staff is proposing the following acute¹ and chronic² water column numeric targets for chlorpyrifos and diazinon in units of micrograms per liter (µg/L):

Table 4. Water Column Numeric Targets

Pesticide	Acute (µg/L).	Chronic (µg/L).
Chlorpyrifos	0.025	0.015
Diazinon	0.16	0.10

These water column numeric target values are derived from the California Department of Fish and Game's *Water Quality Criteria for Diazinon and Chlorpyrifos* (Siepmann and Finlayson, 2000). Diazinon criteria were modified based on a July 30, 2004 memorandum from California Department of Fish & Game (CDFG, 2004) to the Central Valley Regional Water Quality Control Board (CVRWQCB) that documents CDFG's reevaluation of their original work based on new information received by the CVRWQCB. The water column numeric targets listed in Table 4 are identical to water quality objectives that have been adopted by the CVRWQCB and included in their Basin Plan.

Total Maximum Daily Load

Diazinon and chlorpyrifos have the same mechanism of toxic action and research shows that additive toxicity occurs in aquatic invertebrates when diazinon and chlorpyrifos co-occur (Bailey et al., 1997; Siepmann and Finlayson, 2000). Studies of mixtures of compounds acting through the same mechanism suggest there is no concentration below which a compound will no longer contribute to the overall toxicity of the mixture (Deneer et al., 1988). Therefore, the total potential toxicity of co-occurring diazinon and chlorpyrifos concentrations needs to be considered, even when one or both of their individual concentrations would otherwise be below thresholds of concern. Therefore, Staff is proposing a TMDL expressed as an additive toxicity formula. The additive toxicity formula has been scientifically peer reviewed and subsequently

¹ Acute (1- hour average). Not to be exceeded more than once in a three year period.

² Chronic (4-day average). Not to be exceeded more than once in a three year period.

adopted as Basin Plan Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (CVRWQCB, 2007).

The TMDL for diazinon and chlorpyrifos within the Project area is:

$$S = \frac{C_D}{NT_D} + \frac{C_C}{NT_C} \leq 1.0$$

Where

C_D = diazinon concentration in $\mu\text{g/L}$.

C_C = chlorpyrifos concentration in $\mu\text{g/L}$.

NT_D = acute or chronic diazinon numeric target in $\mu\text{g/L}$.

NT_C = acute or chronic chlorpyrifos numeric target in $\mu\text{g/L}$.

Samples collected within the applicable numeric target averaging period and analyzed using acceptable method detection limits will be used to determine compliance with the allocations and loading capacity. For purposes of calculating the sum (S) above, analytical results that are reported as “nondetectable” concentrations are considered to be zero.

Allocations

Water Board staff is proposing that waste load allocations (WLA) for point source dischargers and load allocations (LA) for nonpoint source discharges be equal to the TMDL, as defined in the TMDL additive toxicity formula expressed above.

Water Board staff is proposing to use existing regulatory orders, or their renewals, to implement the TMDL and assure compliance with the allocations; no new regulatory actions are proposed at this time.

Irrigated Agriculture

Staff is proposing that the requirements necessary to achieve the allocations to discharges from irrigated lands for chlorpyrifos and diazinon be administered through the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Conditional Agricultural Waiver, Order No. R3-2004-0117), or subsequent renewals thereof. Water Board staff anticipates that the current Conditional Agricultural Waiver will be renewed in 2010, and the forthcoming renewal will provide the requirements necessary to achieve the allocations to irrigated lands.

Owners and/or operators of irrigated agricultural lands are the implementing parties responsible for achieving the allocations.

Storm drain discharges to municipally owned and operated storm sewer systems (MS4s)

Staff is proposing that the requirements necessary to achieve the allocations to point discharges be administered through existing NPDES permits, or subsequent renewals thereof. The Central Coast Water Board will address discharges of chlorpyrifos and diazinon from the City of Salinas (City) and County of Monterey's (County) municipal separate storm sewer system by regulating the City and County under existing storm water permits, or renewals thereof.

As permittees, the City and County must develop wasteload allocation attainment plans, which are plans describing at how the permittees will achieve TMDL allocations. The Central Coast Water Board will expect the wasteload allocation attainment plans to be thorough plans designed to guide the implementation of activities that will achieve TMDL wasteload allocations.

Monitoring

Water quality monitoring and reporting requirements are necessary to assess progress towards attaining numeric targets and allocations, as well as evaluating the effectiveness of implementation actions. Monitoring requirements will be described in the regulatory mechanisms described above, i.e., through the Conditional Agricultural Waiver and storm water permits.

Water Board TMDL staff recommends a quarterly monitoring frequency, or greater, whereby two quarters are within the dry season (May-October) and two quarters are within the wet season (November-April). Staff recommends that one wet season sampling event should coincide with a storm event. When water quality data indicate progress towards attaining the numeric targets and load allocations, staff recommends increasing the frequency of monitoring so that the criteria for delisting the waterbody are met as soon as possible.

Progress Review

Water Board staff will evaluate implementation progress every three years.

Additional Requirements

Additional implementation requirements will be considered if management practices do not result in achievement of water quality objectives.

Timeline

Water Board staff anticipates that the TMDL should be achieved in three years for the dry season conditions and 10 years for the wet season conditions.

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NOTE: The information and proposals outlined in this Project Summary are not finalized and are subject to revision or change. Staff will notify interested parties of their right to submit written comment during the formal comment period prior to the Water Board hearing of the proposed Basin Plan Amendment, tentatively anticipated for May 2010. As such, the public comment period is anticipated to begin in February 2010.